

Remarks

Per the recent telephone conference between the Examiner and the undersigned, the Examiner is thanked for agreeing to call the undersigned to have a subsequent telephone conference prior to issuing the next office action. The undersigned's telephone number can be found at the bottom of this Amendment.

In the office action issued December 23, 2004, the Examiner (1) objected to the title of the application; (2) objected to claims 15, 31, 34, 38, and 43 on the basis of certain informalities; (3) rejected claims 1, 2, 6-12, 15-19, 23-28, 31-35, 38-41, and 43-45 under 35 U.S.C. § 103(a) as being unpatentable over German patent DE 4227734A1 (the '734 reference) in view of U.S. Patent No. 5,917,601 issued to Shimazaki et al. ("Shimazaki"); and (4) rejected claims 3-5, 13, 14, 20-22, 29, 30, 36, 37, and 42 under § 103(a) as being unpatentable over the '734 reference in view of Shimazaki, and further in view of U.S. Patent No. 5,886,521 issued to Hassan ("Hassan"). Reconsideration and allowance of the application are requested.

I. Objection to Title

The Examiner objected to the title of the application as being insufficiently descriptive. The title has accordingly been amended to recite "Method And Apparatus For Dynamically Measuring The Thickness Of An Object" to more closely reflect the subject matter of particular claims of the application. This objection should accordingly be withdrawn.

II. Objections to Claims

The Examiner objected to claims 15, 31, 34, 38, and 43 on the basis of certain informalities. Claims 15, 31, 38, and 43 have been amended for purposes of clarification to recite "displaying data specifying the thickness of ..." rather than "displaying data on the thickness of ..." In claim 34, the word "text" has been changed to "test" to correct an obvious typographical error. The objections to the claims should be withdrawn in view of these amendments.

III. § 103 Claim Rejections

The Examiner rejected claims 1, 2, 6-12, 15-19, 23-28, 31-35, 38-41, and 43-45 as being obvious over the '734 reference Shimazaki. The Examiner contends that all of the limitations of the rejected claims are disclosed by the 'the '734 reference except for "a position sensing means for determining the position of the object." The Examiner contends that this feature is shown by Shimazaki. In particular, the Examiner stated that "Shimazaki teaches to use optical sensing means 6, 7 to determine the position of the object (e.g., Fig. 4). Consequently, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of '734 to have included the position sensing means as taught by Shimazaki to accurately determine the position of the object." (office action, page 3). These rejections should be withdrawn for the reasons set forth below.

Independent claim 1 of the present application is set forth below:

1. An apparatus for dynamically measuring thickness of a test object, comprising:

an eddy current sensor having first and second sensor heads, said sensor heads positioned to have a predetermined gap therebetween for passage by at least a portion of the test object through said gap, said first and second sensor heads making measurements at one or more sampling locations on said test object when at said gap;

a mechanism for moving the test object through said gap while said measurements are made;

a position sensing mechanism, said position sensing mechanism being used to determine one or more positions of said one or more sampling locations on said test object; and

an evaluation circuit in communication with the eddy current sensor and with the position sensing mechanism, said evaluation circuit being used to determine the thickness of the test object at said one or more sampling locations. (emphasis added)

According to an English language translation provided by the Examiner, the '734 reference discloses measuring the thickness of a coating on a film by passing the film through a gap between pairs of sensors. There is no disclosure or any suggestion of

determining the locations on the film at which the measurements are made as the Examiner acknowledges. The '734 reference therefore does not disclose "a position sensing mechanism, said position sensing mechanism being used to determine one or more positions of said one or more sampling locations on said test object" as specified by claim 1. The Examiner contends that Shimazaki discloses this feature.

Shimazaki discloses a position detecting device used for determining the position of a wafer as it is held in the "hand" of a robot in order to determine whether the wafer is in a proper position so that it can later be moved accurately into a processing chamber. The position of the wafer is determined using optical sensors to detect the edge of the wafer while the wafer is stationary. (col. 5, lines 1-13).

The '734 reference and Shimazaki are not properly combinable in the manner suggested by the Examiner because the '734 reference discloses making thickness measurements of an object while the object is moving. The Shimazaki device, however, is designed to determine whether an object is in a proper position, and that determination is made while the object is still. Given these different approaches and purposes of making measurements, the references would not suggest combination to one skilled in the art. Moreover, it is not apparent how the processes of the '734 and Shimazaki references could be used together given that one is designed to operate with the object to be measured being stationary and the other with the object in motion.

In any event, even if the references are properly combinable, their combination would not teach each and every limitation of claim 1. As mentioned, Shimazaki discloses determining the position of the object itself. It does not disclose or suggest determining particular locations on the object. Claim 1 requires a position sensing mechanism being used to determine one or more positions of said one or more sampling locations on said test object. Therefore, even if the references are combinable in the way asserted by the Examiner, they do not disclose all the limitations of the claim.

The Hassan reference cited by the Examiner with respect to claims 3-5, 13, 14, 20-22, 29, 30, 36, 37, and 42 for disclosing a displacement sensor does not cure the deficiencies of Shimazaki and the '734 reference.

Claim 1 and dependent claims 2-10 are therefore patentable over the cited references.

The remaining claims in the application are also patentable over the references. Independent claim 11 specifies "determining one or more positions of said one or more sampling locations on said test object." Claim 11 and its dependent claims 12-17 are also patentable over the cited references.

Independent claim 18 specifies "a position sensing mechanism to sense positions of said wafer substrate relative to said sensor heads as said wafer substrate is passed through said gap." Claim 18 and its dependent claims 19-27 are also patentable over the cited references.

Independent claim 28 specifies "determining positions of said sampling locations on said wafer substrate." Claim 28 and its dependent claims 29-33 are also patentable over the 'the '734 reference and Shimazaki.

Independent claim 34 specifies "determining positions of said sampling locations." Claim 34 and its dependent claims 35-38 are also patentable over the cited references.

Independent claim 39 specifies "means for determining positions of said sampling locations." Claim 39 and its dependent claims 40-43 are also patentable over the cited references.

Independent claim 44 specifies "determining one or more positions of said one or more sampling locations on said test object." Claim 44 and its dependent claim 45 are also patentable over the cited references.

Claims,1-45 are pending in the present application. As the application is now believed to be in condition for allowance, issuance of a Notice of Allowance is respectfully requested.

The Commissioner is hereby authorized to charge any fee deficiency associated with this submission, or credit any overpayment to Deposit Account No. 08-0219.

Respectfully submitted,



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